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During this month the ravages of grasshoppers are, in the West, very wide-spread. We have just received from Major F. Hawn, of Leavenworth, Kansas, a most interesting account of the Red-legged Locust (*Caloptenus femur-rubrum*). "They commence depositing their eggs the latter part of August, which are fusiform, slightly gibbous, and of a buff-color. They are placed about three-fourths of an inch beneath the surface, in a compact mass around a vertical axis pointing obliquely up and outward, and are partially cemented together, the whole presenting a cylindrical structure, not unlike a small cartridge. They commence hatching in March, but it requires a range of temperature above 60° F. to bring them to maturity, and under such conditions they become fledged in thirty-three days, and in from three to five days after, they enter upon their migratory flight.

"Their instincts are very strong. When food becomes scarce at one point, a portion of them migrate to new localities, and this movement takes place simultaneously over large areas. In their progress they stop at no obstacle they can surmount. In these excursions they often meet with other trains from an opposite direction, when both join in one.

"The insects are voracious, but discriminating in their choice of food, yet I know of no plant they reject if pressed by hunger; not even the foliage of shrubs and trees, including pine and cedar."—A. S. P.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

Lyceum of Natural History. *New York, April* 22, 1867.—Prof. Newberry read a paper on the "Ancient Vegetation of North America." In this paper the Professor briefly reviewed the records with which geology has furnished us of the changes that have taken place in the vegetation of this continent, from the earliest palæozoic ages to the present time. Of this sketch the most important facts cited were as follows:—

First,—Vegetables only have the power to assimilate inorganic substances in nature, the animal kingdom being wholly dependent on the vegetable for its substance, and could not exist without it. Plants must therefore have preceded animals upon the globe, and spontaneous generation, if it were possible, should result in the production of plants first, of animals only from them. Remains of plants occur in the oldest rocks, but only of the lowest types, seaweeds.

Second,—The first land plants appear in the Upper Devonian rocks, conifers, ferns, lycopods, etc., the advance guard of the carboniferous flora, and having the same general character. From the variety and comparatively high organization of these plants we must infer either the somewhat sudden creation of an elaborate flora, or a great hiatus in geological history, in which its origin and development are lost.

Third,—The carboniferous flora of America is essentially the same as that of the coal-measures of the old world. Of six hundred species recognized here, at least one-third are considered identical with European forms, while the genera are nearly all the same.

The carboniferous period was one of depression in this country; the western part of the continent being all beneath the ocean, though extensive land-surfaces had existed there before. A belt of country north of the St. Lawrence was then—as it has constantly been since the beginning of the palæozoic ages—out of water, as was most of New York, and part of New England. The coal-plants grew in marshes on the western margin of the land at the sea level; a gradual submergence producing a succession of vegetable deposits, one above another. The climate was moist, uniform, and warm, but not hot, as vegetable matter would, in that case, have decayed and not bitumenized. The atmosphere was also more highly carbonated than now.

Dr. Newberry exhibited drawings of some of the most characteristic plants and fruits of the coal period, with many not yet described. He said, also, that from the similarity of the flora of the coal-measures in different countries we must conclude that all the vegetation of the world at this period was of the character indicated by these specimens, and that more highly-organized plants had not yet been called into existence.

Fifth,—The Permian flora was not represented in any collection made on this continent, but from the plants obtained from the Permian rocks abroad, it was evident that the flora of that period was, like the fauna, but a continuation of that of the carboniferous.

Sixth,—In passing the interval which separates the mesozoic from the palæozoic ages we entered a new world, in which all the aspects of nature were quite unlike those of the preceding periods. New mollusks and new fishes swim in the seas; reptiles were the monarchs of animated nature,—swimming, walking, flying, carnivorous and herbivorous, in size ranging from the mouse to the whale, they filled the places now occupied by reptiles, birds, and mammals. The vegetation of the triassic and jurassic periods was as peculiar as the fauna, and constituted a distinct chapter in the botanical history of the world. The most conspicuous plants of this flora were the cycads,—now represented, by the *Lagopalene*, etc.,—which had no existence before, and has since formed an insignificant portion of the vegetation of the earth's surface. Drawings were exhibited of cycads, conifers, and ferns from the mesozoic rocks of Europe, China, North Carolina, New Mexico, and Sonora, showing the similarity of the flora of different countries in the triassic and jurassic periods.

Seventh, — With the commencement of the cretaceous period the flora of the world was again revolutionized, and the highest order of plants — the angiosperms — make their first appearance; in Europe, mingled with the remains of the preceding flora, in America in overwhelming numbers. In the lower cretaceous rocks of this continent we have already discovered nearly one hundred species of broad-leaved dicotyledonous plants, including several genera now living in our forests, such as willows, poplars, tulip-tree, sassafras, magnolia, sycamore, beech, etc. From these facts it appears that the vegetation of North America had not greatly changed from the beginning of the chalk period to the present time, showing great permanence in the physical condition of the country.

Eighth, — Of our Eocene flora we have obtained few specimens. The flora of Europe, during that period, was decidedly tropical in character.

Ninth, — The Miocene flora of America has been very fully illustrated by the collections made in Mississippi, on the Upper Missouri, near the mouth of Frazer River, on the McKenzie, and on Disco Island, off the west coast of Greenland. Over one hundred species have been obtained from these localities, some of which were common to them all. Several of these species are now living in our country, and quite a number have been found in the Miocene tertiary of Europe.

The most important part of Dr. Newberry's paper was that which included a comparison of the Miocene flora of America with that of Europe of the same age, and both with living floras of the two continents. The conclusions derived from their comparisons are briefly as follows: —

First, — The living flora of North America is the legitimate progeny of the cretaceous and tertiary floras of the same continent; most of the genera of the earlier floras being continued into the present one, and many species of the Miocene being apparently identical with some now living.

Second, — In the Miocene epoch, the European and American continents were connected at the north, and over this bridge the American flora passed to Europe, leaving its records on Disco Island, Iceland, the Island of Mull, etc. This flora is that of a temperate climate, and, following a depression of temperature, it replaced the Eocene tropical flora of Europe, and for a time covered the surface of that country with American plants, magnolia, liquid amber, sassafras, liriodendron, etc., etc.

Third,—That at a subsequent period, the connection between the two continents was severed by a depression of North-west Europe, and the American flora was nearly exterminated by the present flora of Europe, which is mostly of Asiatic origin.

Fourth,—The present flora of China and Japan, as Professor Gray has shown, has many American elements, probably the living representatives of the Miocene flora. One genus, Glyptostrobus, a conspicuous feature in the Miocene flora in America and Europe, is now living only there; and several American Miocene and living species (*Onoclea sensibilis*, etc.) now form part of the flora of Japan. These plants are probably the descendants of American Miocene emigrants.

Dr. Newberry also exhibited drawings of a number of fossil fishes and reptiles from the coal-measures of Ohio. The fishes represented the genera Diplodus, Pleuracanthus, Megalichthys, Palæoniscus, Cœlacanthus, Rhizodus, Eurylepis, etc., of which the species were all new, and the last a new genus. Of the reptilian remains, the most perfect had been described by Professor Wyman, under the name of Ranaceps Lyellii; the others included several much larger and yet undescribed forms. Among these reptilian bones were two elongated vertebral columns, which, from their singular structure, in the absence of the head and extremities, had greatly puzzled our comparative anatomists. Dr. Newberry announced, however, that this mystery was solved by a recent discovery in the Irish coal-measures of complete individuals of what seemed, from the descriptions given, to be identical species. These had been described by Professor Huxley, under the name of Ophiderpton, or snake-lizard, a very appropriate name, as these reptiles had an elongated snake like form, with insignificant limbs, something similar to our living Cæcilia, but being doubtless an amphibian. The associated reptiles were also probably amphibious, aquatic in habit, and to be compared with Menopoma and Menobranchus.

The president, Professor C. A. Joy, read a report upon recent chemical discoveries and applications.

Mr. Bailey exhibited a fossil frog from the brown coal of the Rhine. It resembles closely some of the living species, and the question was discussed whether live toads were ever actually found imbedded in the rock. The president stated that there was no authentic instance of a live toad having been found in the solid rock. All such stories were myths, and no scientific man gave any credence to them.

California Academy of Natural Sciences. *San Francisco, May* 6, 1867.—The Committee on Field Excursions reported in reference to the recent excursion to the Twelve Mile Farm, on the San José Road. Mr. Lorquin mentioned the species of birds seen or collected. Mr. Yale presented a fragment of rock from the fossiliferous outcrop near the above place,—a blue sandstone, which is undergoing decomposition, containing many species of shells of post-pliocene forms, many of them the same as living species, according to Mr. Stearns. Prof. Whitney remarked upon the singularly isolated character of this outcrop, which is also quite narrow and limited. He had tried to find traces of it many miles beyond, but did not succeed. The fact was one of many evidences going to show the extensive denudation that had occurred in this part of the State. Dr. Behr presented a chrysalis of a peculiar moth from Mazatlan, the female of which does not undergo a metamorphosis or change from the grub state, while the mate is the same as other moths.

Mr. Stearns submitted, on behalf of Mr. J. Rowell, a description of a new species of *Pisidium*, a genus of fresh-water bivalves, found at Angel Island on the occasion of the late excursion, to which is given the name of *P. Angelica.* He also read a paper upon Parhelia, and a recent display of these phenomena witnessed by him in this city. Some remarks followed upon sun and moon halos, during which Dr. Gibbons combated the popular notion that halos about the moon were infallible signs of rain. His observations proved that in some seasons these signs invariably failed in California, and at the East no rule, he thought, could be established on the subject.

Mr. Goodyear read a paper by Prof. Silliman, noticing new localities of diamonds. One from French Corral weighed 5.114 grains, equal to 1⅓ carats, symmetrical in form, and slightly yellow in color from being subjected to a fire test. It was found in the gravel washings. The second specimen is from Forest Hill, El Dorado [Placer?] county; weight 5.673 grains, equal to nearly 1½ carats; color good, but less perfect and symmetrical than the first. The third specimen is from Fiddletown, Amador county. It is smaller and less perfect than either of the others. Since 1855 five diamonds are known to have been found at Fiddletown, none weighing much over a carat. All were found in a gray, cemented gravel, underlying a stratum of lava or compact volcanic ashes. The fourth specimen is from Cherokee Flat, Butte county, which has acquired some reputation as a diamond locality. It has been cut and set in a ring.

Prof. Whitney remarked that there are fifteen localities in California at which diamonds have been found in the course of washings for gold. In reply to a question if there was not some familiar test by which miners might prove them, he answered that the easiest way was to try their hardness on other gems, but miners have not always these convenient to do so. A knowledge of the crystalline form, twenty-four sided and the faces curved, was the surest test. He said that the popular notion that a diamond could be hammered on an anvil without breaking was a mistake, resulting from confounding hardness and toughness. He remarked further that it would not pay in California to wash the gravel beds solely for diamonds. Diamond washings do not pay in any country except with slave or convict labor.

Prof. Whitney read a paper on the geological position of coal. The object of this paper was to show how completely the result of modern geological explorations and discoveries had done away with the old idea that valuable beds of coal are confined to any one member of the series of geological formations. The recent investigations of geologists in India, China, Australia, New Zealand, South America, and on the Pacific Coast of North America were noticed and commented on. It was shown that while the important coal-fields of Eastern Europe and Eastern United States are of Palæozoic age, those of India, China, and Australia, on the other hand, belong to the Mesozoic series chiefly, although there are important deposits even as recent as the Cainozoic or Tertiary. Prof. Whitney remarked on the distribution of the principal coal-fields of the world into two great groups, on opposite sides of the globe; one of them is of Palæozoic and the other of Mesozoic age. He referred particularly to the coal of the Pacific coast of North America, and gave a brief account of its geographical distribution and geological age, noticing particularly the fact that most of the valuable fields of that region belong to the Cretaceous series, a geological formation which, in other parts of the world, has been found to be one of the most barren in combustible materials. In conclusion, the importance of coal discoveries in the region between the Rocky Mountains and California to the successful operation of the Pacific Railroad was explained, and the hope expressed that the geological expedition recently set on foot by the General Government—at the head of which is Mr. King, late of the California Survey—might be the means of giving to the world reliable information in regard to the coal resources of that region, of which we now know so little.

Dr. Cooper stated that Mr. Bischoff, the zoölogist appointed to accompany the Government exploration of Russian America, was now on his way hither, if he had not already arrived. When on that coast before, he had found birds nearly identical with living species in Asia, a fact of much interest, since none of the same species are found on the eastern coast of America. There is here another suggestion of the former intimate relations between western America and Asia.

Prof. Whitney submitted for publication a very valuable and original paper by Baron Richthofer, on the subject of geology, particularly with reference to the natural system of volcanic rocks. Its publication as the first volume of the Academy's Memoirs was proposed. It consists of one hundred and fifty manuscript pages.

BOOKS RECEIVED.

Observations upon the Cranial Forms of the American Aborigines. By J. Aitken Meigs, M. D. Philadelphia, 1866. pp. 39, 8vo.

American Pomology. Apples. By Dr. John A. Warder. 290 illustrations. New York, Orange Judd & Co. 12mo.

Hardwicke's Science Gossip. London, May, 1867. London, R. Hardwicke. Royal 8vo.

The Naturalist's Note-book, No. 5. May, 1867. London, small 4to.

Notes on the Vespertilionidæ of Tropical America. By H. Allen, M.D. From the Proceedings of the Academy of Natural Sciences. August, 1866. 8vo. pp. 9.

Geographical Catalogue of the Mollusca found west of the Rocky Mountains, between latitudes 33° *and* 49° *N.* By J. G. Cooper, M. D. San Francisco, 1867. 4to, pp. 40.

Practical Entomologist. Philadelphia Entomological Society. April, May, June, 1867.

The American Bee Journal and Gazette, Vol. 2, Nos. 11, 12. May, June, 1867. Washington, D. C. 8vo.

The Taxidermist's Manual. Third Edition. By S. H. Sylvester. Middleboro', Mass. 16mo., pp. 29.

Abstract from a Verbal Discourse upon the Mounds and the Mound Builders of Ohio. By Colonel Charles Whittlesey. 8vo, pp. 5.

Report of the Progress of the Geological Survey of North Carolina, 1866. By Professor W. C. Kerr. Raleigh, 1867.

An Elementary Treatise on American Grape Culture and Wine Making. By Peter B. Mead. Illustrated with nearly 200 engravings drawn from nature. New York, Harper & Brothers. 1867, 8vo. From A. Williams & Co.

Histoire des Picea qui se rencontrent dans les Limits du Canada. Par L'Abbé Ovide Brunet. Quebec, 1866. 8vo, pp. 16. With three plates.

Catalogue des Végétaux Ligneux du Canada. Par L'Abbé Ovide Brunet. Quebec, 1867. 8vo, pp. 64.